

What is claimed is:

1. An optical disc recording apparatus for recording video objects on an optical disc, wherein

a recording area of the optical disc is divided into a plurality of blocks, each of which is composed of a set of  $N\_sec$  consecutive sectors, each sector having a size of  $S\_size$  bytes, the optical disc records sector information showing data assignment for each sector on the optical disc, .

said optical disc recording apparatus comprising:

a reading unit operable to read the sector information from the optical disc;

a detecting unit operable to detect a series of consecutive unassigned sectors on the optical disc by referring to the read sector information, a total size of the series being no smaller than a predetermined size that corresponds to a data amount that ensures the reproduction apparatus for uninterrupted reproduction of the video object; and

a recording unit operable to divide and record a video object onto two or more series of consecutive unassigned sectors detected by the detecting unit, and

the predetermined size is the number of blocks which is represented as "N" in the following formula:

$$N = dN + Vo * (Tj + Ts) / ((N\_sec * 8 * S\_size) * (1 - Vo / Vr)),$$

where "dN" is a number of blocks, in the series of consecutive unassigned sectors, that include defective sectors, "Tj" represents a maximum jump time of an optical pickup of a reproduction apparatus, "Ts" represents a time taken by the optical pickup to skip dN blocks, "Vr" represents an input transfer rate of a track buffer of the reproduction apparatus, and "Vo" represents an effective output transfer rate of the track buffer.

2. The optical disc recording apparatus of Claim 1 further comprising

unit operable to generate management information showing  
5 areas of the optical disc where the video object has been recorded by the recording unit.

3. An optical disc recording method for recording video objects on an optical disc, wherein

10 a recording area of the optical disc is divided into a plurality of blocks, each of which is composed of a set of N\_sec consecutive sectors, each sector having a size of S\_size bytes,  
the optical disc records sector information showing data assignment for each sector on the optical disc,

15 said optical disc recording method comprising:

a reading step for reading the sector information from the optical disc;

20 a detecting step for detecting a series of consecutive unassigned sectors on the optical disc by referring to the read sector information, a total size of the series being no smaller than a predetermined size that corresponds to a data amount that ensures the reproduction apparatus for uninterrupted reproduction of the video object; and

25 a recording step for dividing and recording a video object onto two or more series of consecutive unassigned sectors detected by the detecting unit, and

the predetermined size is the number of blocks which is represented as "N" in the following formula:

$$N = dN + V_o * (T_j + T_s) / ((N\_sec * 8 * S\_size) * (1 - V_o / V_r)),$$

30 where "dN" is a number of blocks, in the series of consecutive unassigned sectors, that include defective sectors, "Tj" represents a maximum jump time of an optical

pickup of a reproduction apparatus, "Ts" represents a time taken by the optical pickup to skip dN blocks, "Vr" represents an input transfer rate of a track buffer of the reproduction apparatus, and "Vo" represents an effective output transfer rate of the track buffer.

4. The optical disc recording method of Claim 3 further comprising

a step for generating management information showing areas of the optical disc where the video object has been recorded by the recording unit.

5. A computer-readable recording medium recording a program for recording video objects on an optical disc, wherein

a recording area of the optical disc is divided into a plurality of blocks, each of which is composed of a set of N\_sec consecutive sectors, each sector having a size of S\_size bytes,

the optical disc records sector information showing data assignment for each sector on the optical disc,

said program causing a computer to execute:

a reading step for reading the sector information from the optical disc;

a detecting step for detecting a series of consecutive unassigned sectors on the optical disc by referring to the read sector information, a total size of the series being no smaller than a predetermined size that corresponds to a data amount that ensures the reproduction apparatus for uninterrupted reproduction of the video object; and

a recording step for dividing and recording a video object onto two or more series of consecutive unassigned sectors detected by the detecting unit, and

the predetermined size is the number of blocks.

which is represented as "N" in the following formula:

$$N = dN + Vo * (Tj + Ts) / ((N\_sec * 8 * S\_size) * (1 - Vo / Vr)),$$

where "dN" is a number of blocks, in the series of consecutive unassigned sectors, that include defective sectors, "Tj" represents a maximum jump time of an optical pickup of a reproduction apparatus, "Ts" represents a time taken by the optical pickup to skip dN blocks, "Vr" represents an input transfer rate of a track buffer of the reproduction apparatus, and "Vo" represents an effective output transfer rate of the track buffer.

6. The computer-readable recording medium of Claim 5, wherein the program further causes the computer to execute a step for generating management information showing areas of the optical disc where the video object has been recorded by the recording unit.

7. A rewritable optical disc, wherein a recording area of the optical disc is divided into a plurality of blocks, each of which is composed of a set of N\_sec consecutive sectors, each sector having a size of S\_size bytes, the recording area recording a series of consecutive unassigned sectors, a total size of the series being no smaller than a predetermined size that corresponds to a data amount that ensures a reproduction apparatus for uninterrupted reproduction of the video object,

the recording area recording sector information showing data assignment for each sector on the optical disc, and the predetermined size is the number of blocks which is represented as "N" in the following formula:

$$N = dN + Vo * (Tj + Ts) / ((N\_sec * 8 * S\_size) * (1 - Vo / Vr)),$$

where "dN" is a number of blocks, in the series of

consecutive unassigned sectors, that include defective sectors, "Tj" represents a maximum jump time of an optical pickup of the reproduction apparatus, "Ts" represents a time taken by the optical pickup to skip dN blocks, "Vr" represents an input transfer rate of a track buffer of the reproduction apparatus, and "Vo" represents an effective output transfer rate of the track buffer.

8. The rewritable optical disc of Claim 7 further recording management information showing areas of the optical disc where the video object has been recorded.

9. An optical disc recording apparatus in which an optical disc is inserted, wherein

a recording area of the optical disc is divided into a plurality of blocks, each of which is composed of a set of N\_sec consecutive sectors, each sector having a size of S\_size bytes, the optical disc records sector information showing data assignment for each sector on the optical disc,

said optical disc recording apparatus comprising:

a reading unit operable to read the sector information from the optical disc;

a detecting unit operable to detect a series of consecutive unassigned sectors on the optical disc by referring to the read sector information, a total size of the series being no smaller than a predetermined size that corresponds to a data amount that ensures the reproduction apparatus for uninterrupted reproduction of the video object; and

a recording unit operable to divide and record a video object onto two or more series of consecutive unassigned sectors detected by the detecting unit, and

the predetermined size is the number of blocks which is represented as "N" in the following formula:

$$N = dN + V_o * (T_j + T_s) / ((N\_sec * 8 * S\_size) * (1 - V_o / V_r)),$$

where "dN" is a number of blocks, in the series of 5 consecutive unassigned sectors, that include defective sectors, "Tj" represents a maximum jump time of an optical pickup of a reproduction apparatus, "Ts" represents a time taken by the optical pickup to skip dN blocks, "Vr" represents an input transfer rate of a track buffer of the reproduction apparatus, and "Vo" represents an effective output transfer rate of the track buffer.

10. The optical disc recording apparatus of Claim 9 further comprising

unit operable to generate management information showing areas of the optical disc where the video object has been recorded by the recording unit.